2018 Spring Netting (SNI) Summary Report

Weyauwega Millpond

Waupaca County (WBIC 257700)

Introduction and Survey Objectives

In 2018, the Department of Natural Resources conducted a fyke netting survey of Weyauwega Millpond in order to provide insight and direction for the future fisheries management of the water body. Primary sampling objectives of this survey are to characterize species composition, relative abundance, and size structure. The following report is a brief summary of the activities conducted, general status of fish populations and future management options.

Acres: 253 Shoreline Miles: 7.33 Maximum Depth (feet): 11
Lake Type: Impoundment Public Access: Two public boat launches
Regulations: All species default statewide regulations

WISCONSIN DNR CONTACT INFO.

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Survey Information						
Site Location	Survey Dates	Water Temperature (°F)	Target Species	Gear	Number of Nets	Net Nights
Weyauwega Millpond	3/20/2018 - 4/2/2018	36 - 43	Northern Pike, Panfish	Fyke Net	9	52

Survey Method

- Weyauwega Millpond was sampled according to spring netting (SNI) protocols as outlined in the statewide lake assessment protocol. The primary objective for this sampling period is to count and measure adult walleye. However, this survey can also be used to target adult northern pike. Other gamefish and panfish may be sampled but are considered by-catch as part of this survey.
- Fyke Nets were deployed in areas of the millpond that contained spawning habitat or were likely travel areas for northern pike. All newly captured northern pike were given a partial fin clip (top caudal fin). All northern pike were weighed and age structures (i.e., anal fin rays) were collected from a subsample of northern pike for age and growth analysis.
- Fish metrics used to describe fish populations include catch per unit effort, total abundance, proportional stock density, length frequency distribution, mean age at length, and relative weight.

Fish Metric Descriptions

Catch per unit effort (CPUE) is an index used to measure fish population relative abundance, which simply refers to the number of fish captured per unit of distance or time. For netting surveys, we typically quantify CPUE by the number and size of fish per net night. CPUE indexes are compared to statewide data by percentiles and within lake trends. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state.

Total abundance is a metric that describes population size and is estimated by mark and recapture. In our study, all northern pike that were captured were given a partial caudal fin (i.e., tail fin) clip and released. Each time the nets were checked, all northern pike were examined for a partial caudal fin clip. The number of previously captured individuals (i.e., fin clipped) was recorded and proportions of marked individuals to unmarked individuals was used to estimate the total abundance of the northern pike population.

Proportional Stock Density (PSD) is an index used to describe size structure of fish populations. It is calculated by dividing the number of quality size fish by the number of stock size fish for a given species. PSD values between 40 - 60 generally describe a balanced fish population.

Length frequency distribution (LFD) is a graphical representation of the number or percentage of fish captured by half inch or one inch size intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

Mean Age at Length is an index used to assess fish growth. Calcified structures (e.g., otoliths, fin rays, or scales) are collected from a specified length bin of interest (e.g., 20 - 21 inches for northern pike). Mean age is compared to statewide data by percentile with growth characterized by the following benchmarks: slow (<33rd percentile); moderate (33rd to 66th percentile); and fast (>66th percentile).

Relative Weight (W_r) is an index used to assess the plumpness (i.e., condition) of fish. It is calculated by comparing the observed weight of a fish to the standard weight (i.e., predicted average weight) of that fish given its length. A relative weight of 93 means it has average plumpness/weight compared to other fish of the same length. Relative weights above 93 mean it is more plump and in better condition than average.

Relative Abundance (Catch per Unit Effort)								
Species	Number Captured in 2018	Historical Median	CPUE (number per net night)				Statewide Percentile Rank	Abundance Rating
			2002	2005	2010	2018		
Black Bullhead	1,717	0.4	0.0	0.7	0.0	33.0	-	-
Black Crappie	54	3.4	2.9	22.7	3.9	1.0	28th	Low -
Bluegill	20	3.3	6.2	14.6	0.4	0.4	10th	Low
Bowfin	0	0.6	0.5	0.7	0.7	0.0	-	-
Brown Bullhead	0	0.1	0.1	0.2	0.4	0.0	-	-
Common Carp	4	0.2	0.1	0.3	0.6	0.1	-	-
Golden	0	0.2	0.3	2.0	0.2	0.0	-	-
Greater	0	0.2	0.4	1.0	0.0	0.0	-	-
Largemouth	14	2.6	0.8	4.5	4.6	0.3	47th	Moderate
Northern Hog	4	1.1	1.2	5.6	1.0	0.1	-	-
Northern Pike	389	5.5	2.9	6.0	5.1	7.5	89th	High
Pumpkinseed	98	2.8	6.1	3.7	0.6	1.9	59th	Moderate
Rock Bass	9	1.2	2.2	3.6	0.3	0.2	-	-
Shorthead Redhorse	7	1.2	1.6	9.6	0.8	0.2	-	-
Smallmouth	0	0.1	0.1	0.1	0.2	0.0	-	-
Warmouth	1	1.8	5.0	2.5	1.1	0.0	-	-
White Sucker	48	1.5	0.9	20.8	2.0	0.9	-	-
Yellow Bullhead	3	9.8	36.5	15.4	4.2	0.1	-	-
Yellow Perch	0	0.1	0.1	0.1	0.3	0.0	-	Low

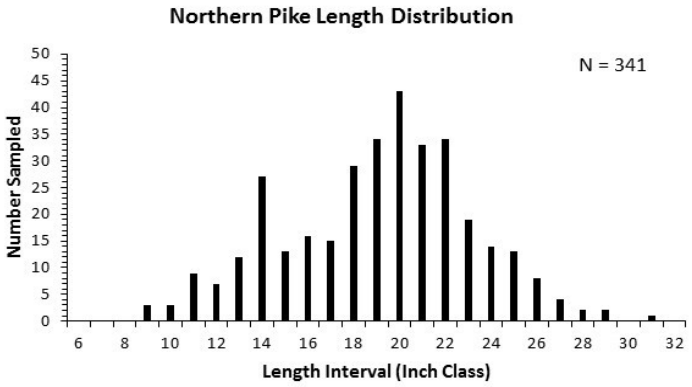
Weyauwega Millpond - Summary Report Continued

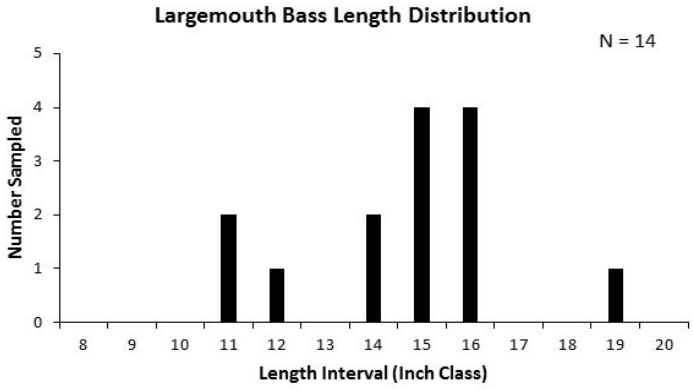
Gamefish Summary

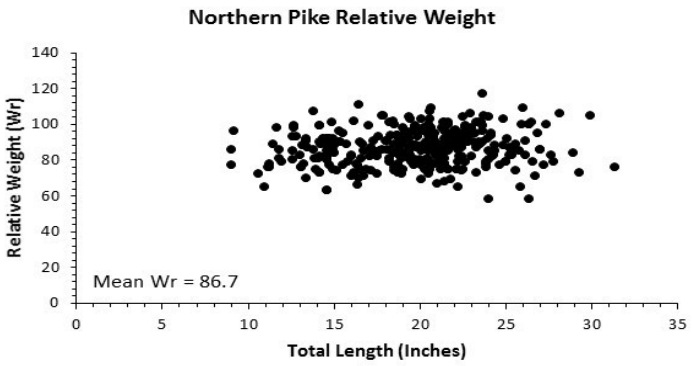
Waupaca County (WBIC 294500)

Size Structure Metrics

Species	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
Northern Pike	341	19.6	9.1 - 31.3	14.0 and 21.0	307	130	42	50th	Moderate
Largemouth Bass	14	15.1	11.4 - 19.6	8.0 and 12.0	14	12	86	70th	Moderate - High







Size Structure (PSD) Trends

Species	Historical Median (1984-Present)	PSD by Year					
		1984	1998	2002	2005	2010	2018
Northern Pike	31	25	27	21	55	35	42
Largemouth Bass	82	80	95	74	68	99	85

Total Adult Abundance (Mark and Recapture Population Estimate)

Species	Number Marked	Number Sampling Events	Number Recaptures	Schnabel Population Estimate (95% C.I.)	Number per Acre (95% C.I.)	Abundance Rating
Northern Pike	341	13	42	1,395 (1,051 - 2,078)	5.2 (4.2 - 8.2)	Moderate - High

Growth Metrics

Species	Total	Length Bin	Mean Age	Age Range	Percentile Rank	Growth Rating
Northern Pike	9	14.0 - 14.9	2.2	2 - 3	43rd	Moderate
Northern Pike	8	21.0 - 21.9	4.3	4 - 5	37th	Moderate
Northern Pike	6	26.0 - 26.9	4.7	4 - 5	69th	Moderate - Fast

Gamefish Summary

Northern Pike

- Northern pike were found in moderate - high densities/abundance when compared to lakes throughout Wisconsin. Fyke net CPUE was slightly higher than catch rates in similar surveys conducted before the drawdown. This indicates that northern pike densities have recovered from the drawdown.
- Size structure of the northern pike population was moderate with a PSD of 42. A PSD of 42 is slightly higher than the historical median PSD for northern pike in Weyauwega Lake and is in the middle of the observed PSD values from the two other most recent fyke netting surveys conducted in 2005 and 2010.
- Following the drawdown, northern pike have grown at moderate to moderate-fast rates with the biggest pike captured being > 31.0 inches. Additionally, northern pike were in slightly below average condition with a mean relative weight of 87. Plenty of forage including bullhead species, sucker species, and panfish are available to hopefully sustain observed trends in growth and condition in the future.
- Northern pike are now reproducing naturally as no northern pike have been stocked since 2014 yet northern pike in every inch class between 9 - 29 inches were captured and northern pike 2 - 3 years old were captured in the 2018 fyke netting survey.

Largemouth Bass

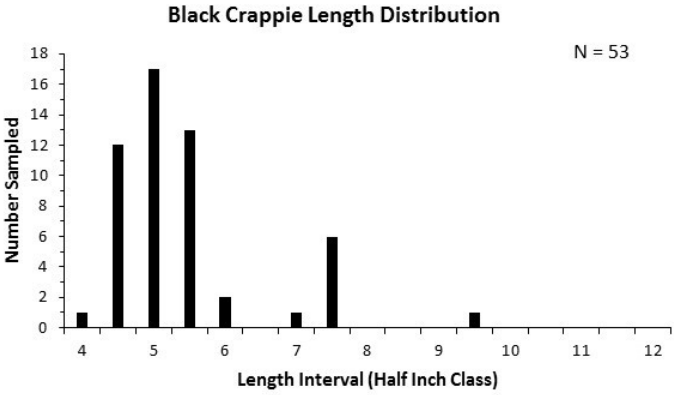
- Few largemouth bass were captured in the spring fyke netting survey. However, electrofishing is a more preferred gear for evaluating the largemouth bass population. A spring electrofishing survey was also conducted in 2018. Results from that survey can be found on a separate report.

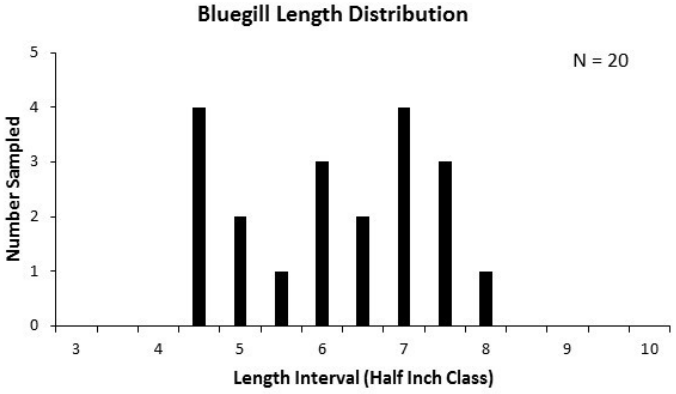
Weyauwega Millpond - Summary Report Continued

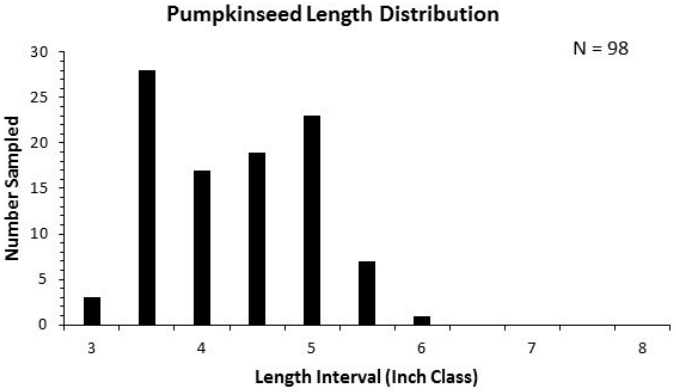
Panfish Summary

Waupaca County (WBIC 257700)

Size Structure Metrics									
Species	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Sizes (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
BLUEGILL	20	6.4	4.5 - 8.3	3.0 and 6.0 inches	20	13	65	62nd	Moderate
BLACK CRAPPIE	53	5.6	4.2 - 9.8	5.0 and 8.0 inches	40	1	3	1st	Low
PUMPKINSEED	98	4.5	3.4 - 6.4	3.0 and 6.0 inches	98	1	1	2nd	Low







Size Structure (PSD) Trends							
Species	Historical Median (1984-Present)	PSD by Year					
		1984	1998	2002	2005	2010	2018
BLUEGILL	87	84	92	87	95	86	65
BLACK CRAPPIE	73	88	93	71	65	76	3
PUMPKINSEED	44	47	64	22	81	41	1

Panfish Summary

Bluegill

- Bluegill were captured in low densities in the 2018 fyke netting survey. However, electrofishing is the more preferred gear for evaluating the bluegill population. Given that water temperatures ranged from 36 - 43, it was likely too cold for many bluegill to be in the shallow marshy upper section of the lake where the fyke nets were set to primarily target northern pike.
- It should be noted that the bluegills that were captured show that Weyauwega Millpond has the potential to support a quality bluegill fishery as bluegill PSD was 65, the mean size of bluegills captured was 6.4 inches, and bluegills as large as 8.3 inches were captured.

Black Crappie

- Despite stocking 2,500 black crappies averaging 4.5 inches in 2014, black crappie were captured in low - moderate densities in the 2018 spring fyke netting survey. Furthermore, densities in the 2018 fyke netting survey were lower than densities observed in the three fyke netting surveys conducted prior to the drawdown between 2002 and 2010.
- Black crappie PSD in the 2018 fyke netting survey was significantly lower than in previous years, driven by the fact that most crappies captured in 2018 were from a one young, small year class of fish that was 4 - 6 inches long.
- Given that few larger black crappies were captured in the 2018 fyke netting survey, the year class between 4 - 6 inches is likely the first good year class that was naturally reproduced since the drawdown. Hopefully, this is the first of many stronger year classes and black crappie densities and size structure will return to levels observed prior to the drawdown when densities were higher and size structure was dominated by larger crappies.

Pumpkinseed

- Pumpkinseed were captured in moderate densities in the 2018 fyke netting survey. However, similar to bluegill, electrofishing is the more preferred gear for evaluating the pumpkinseed population.
- Size structure of the pumpkinseed captured was very poor as only one pumpkinseed ≥ 6.0 inches was captured.

Yellow Perch

- Despite stocking over 2,300 adult yellow perch in 2014, none were captured in the spring fyke netting survey. However, fyke netting is not the preferred gear for evaluating the yellow perch fishery. Yellow perch densities have historically been low in Weyauwega Millpond and that trend is likely continuing following the drawdown.

Stocking History 1972 - Present

Species	Year	Age	Mean Length (inches)	Number Stocked
Walleye	1972	Fry	1.0	3,111,110
Northern Pike	1972	Fry	1.0	3,614,000
Largemouth Bass	1972	Fry	1.0	77,000
Bluegill	1972	Adult	7.0	25,000
Yellow Perch	1972	Adult	14.0	100
Walleye	1972	Yearling	9.0	3,098
Walleye	1972	Fingerling	3.0	6,000
Largemouth Bass	1972	Fingerling	3.0	3,140
Largemouth Bass	1972	Fry	1.0	15,000
Yellow Perch	1987	Adult	7.0	3,000
Walleye	1987	Fingerling	7.0	2,250
Yellow Perch	1987	Adult	7.0	1,500
Walleye	1988	Fingerling	7.0	1,170
Largemouth Bass	2013	Large Fingerling	2.1	7,819
Northern Pike	2013	Small Fingerling	4.7	25,098
Yellow Perch	2014	Adult	4.5	2,322
Largemouth Bass	2014	Large Fingerling	3.2	6,215
Black Crappie	2014	Large Fingerling	4.5	2,500
Northern Pike	2014	Small Fingerling	3.3	25,085
Largemouth Bass	2015	Large Fingerling	1.9	9,771
Bluegill	2016	Fingerling	0.5	21,789

Management Options

Northern Pike

- Northern pike CPUE was high in the spring 2018 fyke netting survey and the 2018 northern pike population estimate also indicated a moderate - high density of northern pike can be found in Weyauwega Millpond.
- Despite high densities, northern pike have been growing at moderate to fast rates, are in decent condition, and have been growing to 26 - 31 inches, likely due to ample forage.
- High densities of northern pike have likely been helping keep densities of panfish species lower, allowing for fast growth rates and high quality panfish fisheries.
- Controlling invasive aquatic plant densities will allow for northern pike to forage efficiently, resulting in faster growth rates for pike and a reduced likelihood of panfish becoming overabundant and stunting.
- If results of future surveys show densities of pike increase and growth rates and condition have declined, a regulation change to a protected slot limit to allow for harvest of smaller pike while protecting larger fish from harvest may be considered.

Largemouth Bass

- Fyke netting is not the most appropriate gear to evaluate the largemouth bass population. Therefore, management recommendations are not provided. See the 2018 electrofishing report for management recommendations for largemouth bass.

Panfish

- Fyke netting is not the most appropriate gear to evaluate the populations of some panfish species including bluegill and pumpkinseed. Therefore, management recommendations are not provided for these species within this report. See the spring electrofishing report for management recommendations on these two species.
- Despite stocking 2,500 black crappies in 2014, black crappies densities have remained low - moderate. However, the majority of the black crappies captured in 2018 were likely from one young, small year class. Therefore, this year class should grow to sizes preferred by anglers within the next couple of years. If future surveys show densities continue to remain low, additional stockings of black crappies may be necessary to sustain a quality fishery.
- Despite stocking over 2,300 yellow perch in 2014, none were captured in the 2018 fyke netting survey. This likely indicates low recruitment of yellow perch. If anglers desire a yellow perch fishery in Weyauwega Millpond, additional stockings will likely be necessary in the future.

Other Management Objectives

- Continue to work with WDNR staff and local lake management organizations to manage aquatic plants. High densities of invasive plants often inhibit the ability of predators to effectively forage resulting in slow growing predator populations. Additionally, prey fish (e.g., bluegill) populations can become overabundant and slow growing when predators cannot effectively forage on them.
- A comprehensive survey report that provides detailed trends in relative abundance and size structure for all gamefish and panfish species captured in fyke netting and electrofishing surveys over the last 20 years is also available.
- Weyauwega Millpond is on an eight year rotation with the next comprehensive survey scheduled for 2026.